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**(54) VALVE OPERATION
TIMING REGULATING
DEVICE FOR INTERNAL
COMBUSTION ENGINE**

(57) Abstract:

PURPOSE: To rapidly prevent the occurrence of an influence owing to the fluctuation of a spool valve and to improve controllability by a method wherein the nature of a closed loop system is made adaptive when the operation timings of a suction and an exhaust valve are regulated through feedback learning control of an object to be controlled containing an integral element, such as a hydraulic device.

CONSTITUTION: A phase regulating mechanism 40 is caused to vary a difference in a rotation phase between the crank shaft 2 and the cam shaft 5 of an internal combustion engine and driven by means of a drive means 205. Meanwhile, based on an engine operation state detected by various sensors 43 and 45, an actual phase angle between the two shafts is detected by means of a rotation phase difference detecting

means 104. The target value of the rotation phase difference is decided by means of a target value deciding means 105. A control value is then produced by means of a control means 46 so that the actual phase difference angle is caused to coincide with the target value of the rotation phase difference, and outputted to a drive means 205. In this case, the control means 46 comprises a cam shaft advance angle direction deciding means 107, an advance angle value learning means 108, and a drive frequency converting means 110 causes drive of the drive means 205.

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